DOCUMENT RESUME

ED 113 340 SP 009 577

AUTHOR	Cichon, Donald J.; Olson, George E.
TITLE	A Study of Measures of Classroom Learning Environments. Technical Report Number 4.
INSTITUTION	Roosevelt Univ., Chicago, Ill. Coll. of Education.
SPONS AGENCY	Spencer Foundation, Chicago, Ill.
PUB DATE	75
NOTE	73p.; Appendix C will reproduce badly
EDRS PRICE	MF-$0.76 HC-$3.32 Plus Postage
DESCRIPTORS	*Classroom Environment; Classroom Observation Techniques; *Educational Environment; *Learning; *Measurement Instruments; *Observation
IDENTIFIERS	*Learning Environment

ABSTRACT

This study deals with the following topics: (1) the extent to which three different learning environment instruments and their underlying conceptual framework are empirically related, and (2) the extent to which intensive observation of classrooms aids in the interpretation of instruments' characterizations of a class. In the first part of the study, three instruments measuring student perceptions of psychological aspects of classroom learning environments were administered to 233 high school students in 11 classes. The three instruments were the Learning Environment Inventory, the Class Activities Questionnaire, and the Authenticity, Legitimacy, and Productivity (ALP) Ethos Instrument. The instrument data were analyzed using the individual as the unit of analysis. The second part of the study involved nonparticipant observatinon of one of the original 11 classrooms. The results provided a baseline of data for the possible synthesis of studies, making use of each instrument separatel y (1) to raise more detailed hypotheses of learning environments, (2) to explicate methodological issues, and (3) for the constructive consideratinon of "unintended" effects of curriculum. (The learning environment instruments and data from the study are included in appendixes.) (Author/RC)

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ED113340

A STUDY OF MEASURES OF CLASSROOM LEARNING ENVIRONMENTS

by

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Technical Report
Number 4

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Research and Development Center
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1975

SP009 577

FOREWORD

The research reported herein was made possible under the provisions of a grant to Roosevelt University by the Spencer Foundation, Chicago, Illinois. Points of view or opinions stated do not, however, necessarily represent the Spencer Foundation policy.

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I. Introduction

A. Background: Classroom Learning Environments

The concept of classroom learning environment, though it has been embodied in a number of research studies in the last decade, is quite amorphous. While at least four general categories of meaning of the concept appear in the research studies (Cichon, 1975), their common foundation lies in the theoretical formulation that behavior is a function of the interaction between person and environment as most generally described by Lewin's "life space" (Randhawa and Fu, 1973). For Lewin "life space" is a dynamic field in which two interdependent vectors, person and environment, interact to affect behavior (Lewin, 1936).

Two other theoretical formulations have sought to further apply the dual dimensionality to educational settings. In one, the Getzels-Thelen "psychosocial model" explicated the interrelationships of the nomothetic dimension (institution, role, and expectation) and the ideographic dimension (individual, personality, and need-disposition) of activity in a social system (the school or classroom) (Getzels and Thelen, 1960). In another the dual concepts of personal needs and environmental press developed by Murray (1938) were implemented in institutional studies by Pace and Stern (1958) and others (Stern, Stein, and Bloom, 1956).

The recent studies of learning environments begin with the well-accepted, though not always understood, notion that teachers, and indeed most students, recognize that each class is different in terms of not only the students' abilities in regard to the subject, but also in terms of such things as personalities, behavior patterns, and interests of the students. Each class seems to have a distinctive "spirit" or "character" which affects how a teacher deals with the class and how the students feel about the class, what

they expect of it, how well they perform in it. In a rough attempt then at a definition, classroom learning environment has been operationalized as: the conglomerate of the students' perceptions of "the relationship of the students to the subject studied, to one another, and to the organizational properties of the class" (Randhawa and Fu, 1973, p. 316).

Classroom learning environments have significance for study in at least two respects. First, an understanding of classroom learning is impossible without consideration of this environment. Walberg (1970), after a review of the known determinants of student scholastic performance, surmised that most of the variance in learning is accounted for by aptitude and "the environment of learning during instruction" (p. 186). In a series of empirical studies, Anderson and Walberg found clear relationships between a number of classroom environment characteristics and student achievement on both the individual and class level (Walberg and Anderson, 1968; Anderson and Walberg, 1968; Anderson, 1970). Thus, given that the environment is at least a "mediator" in the classroom learning process for students, then a more complete understanding of the environment is of value.

In a second respect, the characteristics potentially identified in the learning environment are seen as learnings in themselves, especially so in the last few years in the discussions of the "hidden," "latent," or "secondary" curriculum. Thus, the <u>quality of the students' experiences</u> in the classroom is of direct concern for educators. This notion is not new. For Dewey (1938) experience and education were <u>inseparably</u> connected as means and ends, which enjoy inseparability in general. These notions are employed, at least implicitly, by Joyce and Weil (1972) in their suggestion that students should be exposed to a variety of learning environments, created by different teaching styles or "models."

This study intends to add to the developing understanding of classroom learning environments, using two methodological issues as starting points. For the first, an empirical analysis of the relationships between different classroom learning environment assessment instruments was conducted. The results indicate the explication of the relative salience of clusters of student perceptions of their environment, this in a broader way than is presently shown in the literature, for three theoretical constructs are made use of here. In connection with the first issue, the relationships between discrete elements of each instrument are examined to suggest specific perceptual patterns concerning classroom dynamics. For the second issue, intensive observations of one class are used to supplement its characterization by the learning environment instruments. The result of this portion of the analysis serves to illustrate a valuable interfacing of two different methods in understanding classroom learning environments.

B. Problem: The Relationships Between Assessment Procedures

Studies of the classroom learning environment are derived from different conceptual constructs and follow different research purposes. And since pencil-paper instruments are generally used as the means of assessment, these instruments differ. Yet the studies have common elements in that they often investigate such influences as subject-matter, sex of the teacher, grade level, teacher personality and type of curriculum on the learning environment. Furthermore, the guiding conceptual constructs and dimensions of environment measured appear to overlap to some extent across studies. These studies can and should be compared and synthesized where possible. Such an attempt has been made with some of the current studies dealing with the subject-matter variable. The comparison indicated that

findings from different studies within a subject area appear to contradict each other on some elements, appear to reinforce one another on others, and appear to show unrelated findings on still others (Gichon, 1975).

This result is hardly surprising, yet it does indicate a potentially surmountable obstacle to the pooling of some relatively discrete bits of knowledge into a broader base for theory development and hypothesis testing. In pursuit of the goal of surmounting this "obstacle" the question is raised: To what extent are the various learning environment instruments empirically related? The establishment of such relationships, where they do exist, can serve to: 1) present a baseline set of empirical evidence to cast light on speculative comparisons made across studies as those referred to above; 2) suggest areas of theoretical commonality and divergence for the conceptual schemes underlying each of the instruments studied; these areas of commonality may be considered the stable or core parameters of existing conceptions of classroom learning environments.

A second question posed for this study is: To what extent does intensive observation of classrooms aid in the interpretation of instruments' characterizations of them? This was a sub-question of the study. Its purpose lies mainly in casting light on the validity of the diagnosis, evaluation, or characterization of classroom learning environments using pencil-paper instruments, which is not an uncommon activity.

II. Methods

A. Instruments

Three instruments which fit the operational definition of classroom learning environments as described above were administered to the same group of subjects in eleven high school classes. The instruments were: the Learning Environment (LEI), the Class Activities Questionnaire (CAQ), and the ALP (acronym for Authenticity, Legitimacy and Productivity). (See Appendix A for a copy of each instrument.)

The LEI was developed in conjunction with evaluation studies of Harvard Project Physics, and derives from "group dimensions" identified by Hemphill and Westie (1950). (Anderson, 1973). The inventory consists of 105 statements of possible characterizations of specific elements of the classroom to which the students respond on a "strongly agree" to "strongly disagree" scale of four points. The scoring and interpretation procedure consists of 15 scales, or group dimensions, each comprising seven items from the inventory. Each student's ratings for each item in a scale are simply added together to obtain his score on that scale. Thus the range of possible scores for each scale is 7-28, 7 representing strong disagreement that each item in the scale is characteristic of the class, 28 representing strong agreement of same. For class scores, the scale scores for each individual are averaged across the entire class to obtain the class average on each group dimension. The group dimensions measured are: Cohesiveness, Diversity, Formality, Speed, Environment, Cliqueness, Satisfaction, Disorganization, Difficulty, Apathy, Democratic, and Competitiveness. (Concise definitions of each dimension are included in Appendix A.)

The CAQ was developed in conjunction with the Illinois Gifted Program Evaluation Project. Its stated purpose is "to obtain information concerning

cognitive, behavioral, and affective activities ... students perceived actually occurring in the classroom" (Steele, 1969, p. 1). The questionnaire is composed of 27 statements describing possible activities or student roles in the classroom, to which the students respond on a four point "strongly agree" - "strongly disagree" scale. The scoring and interpretation results in 18 "factors" (some being composed of two items): Memory, Translation, Interpretation, Application, Analysis, Synthesis, Evaluation (those seven from the Bloom Taxonomy), Discussion Opportunity, Test/Grade Stress, Lecture, Enthusiasm, Independence, Divergence, Humor, Ideas Valued, Ideas Enjoyed, Teacher Talk, and Student Preparation Time. (See Appendix A for the Item-Factor descriptions.)

The ALP was developed at the University of Chicago as a part of recent investigations of Classroom Ethos (Thelen, 1974). Classroom Ethos has been operationalized in terms of three dimensions of classroom experiences: their authenticity, their legitimacy, and their productivity (for which ALP is an acronym). It is assumed that every classroom has some elements of all three dimensions which are of interest, not the degree of presence of any dimension as a whole. That is, an experience in the classroom can be authentic in several different ways, for example, in being cognitively stimulating, in relating to one's past experience, in bringing one to an openness toward others' ideas, or in instilling a desire to participate. It is the specific character of the authenticity that is of interest. In a similar manner, legitimacy and productivity subsume several subelements which enable one to assess the nature of those dimensions in a particular classroom or group of classes. The instrument itself consists of 24 statements each placed on individual cards, describing possible characteristics of learning groups which the students rank order on a continuum from "most descriptive of this class" to "least descriptive."

B. Sample and Data Collection

The sample consisted of eleven classes of students in two Chicago public high schools. In early May, 1975, each class was administered the three instruments over a two-day period.[1] There were a total of 190 students who took all three instruments, and 233 who took two of the three. (These figures include only those responses which were in usable form.) The students were all at the sophomore (81), junior (78) and senior (69) levels, and consisted of 115 males and 117 females. The subjects included Mathematics (4 classes), English (4) and Social Studies (3). Though not directly a part of the study, each teacher was presented with the class mean results from each instrument for his or her class.

Additionally, one class was chosen for intensive observation by an "outsider" to answer the second question posed for the study. The method followed was that of non-participant observation as described by Geoffrey and Smith (1968). The observations took place continuously over a two week period, and were supplemented by frequent discussions with the teacher, a structured interview with the teacher concerning some of the measured aspects of the learning environment in his class, and a discussion with the class (after the observation period) on the same matter. The field notes and interview and class discussion transcriptions were analyzed by both the observer/interviewer and this investigator. The results of this portion of the study will be presented in section IIIB of this report.

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[1]This particular time of the data collection is important to note, for the phenomena of drawing near to the end of the school year very likely influenced the particular character of the perceptions measured. The results must be viewed with this in mind. No empirical investigation of the stability of such perceptions over time has been made, to this author's knowledge. It is suspected, however, that changes do occur over time as a result of classroom events, apart from the imperfect reliabilities of the instruments.

C. Analysis

The paper-pencil instrument data were analyzed using the individual as the unit of analysis. The individual rather than the class mean was chosen as the unit for two reasons. One, what was being sought in the study were the general relationships across instruments, those which might be considered invariant across classes, not those influenced by specific classroom conditions (a matter which is of interest and importance, but with which a limited study cannot deal). Two, an N of eleven would not provide stable measures of relationship.

The statistical analyses were based on Pearson Product-Moment Correlations computed between all LEI scales, CAQ factors and ALP items. Given the obvious complexity of the relationships manifested in the correlations, the first attempt at reduction of the data was by a factor analysis of the complete matrix, using the Principal Factor solution with varimax rotations, producing sixteen (16) factors. Since the fifth and successive factors individually accounted for less than seven percent of the variance and showed very few significant loadings on each variable (using the $\pm$ .30 criteria suggested by Child [1970]), a further analysis was made using the same factor method with a four-factor model.

III. Results

A. The Relationships Between the Three Instruments

Factors: The Relative Salience of Perceptions in the Classroom

Those correlations significant at less than the .05 level between LEI scales and ALP items, CAQ factors and ALP items, and LEI scales and CAQ factors are presented in Tables I, II, and III respectively. (The complete matrices are presented in Appendix B.) The four factors and the significant variable loadings on each (.30) are indicated in Table IV. (The complete set of factor loadings and communalities are presented in Appendix C.)

The first factor appears to be most clearly and almost purely an LEI or group dimensions factor. Its most salient component, as determined by the cluster of variables with loadings above .80, is a set of elements largely teacher controlled (Formality, Speed, Goal Direction) or otherwise independent of student in-class activities (Diversity, Environment). We label this set "externally controlled elements," for they are outside of the students' control. A less salient but nevertheless strong component seems to be those perceptions relating to individual feelings about the structure of the class (Satisfaction, Difficulty) and the one-to-one interpersonal relationships which exist (Cohesiveness, Favoritism, Cliqueness). On this less salient level, (by order of factor loadings) but opposed to the personal and interpersonal dimensions, are some aspects of the more functional side of group activity (Democraticness and Competitiveness).

The second factor is largely a CAQ factor, emphasizing the nature of student involvement with intellectual activities in the class (Application, Synthesis and Independent exploration of ideas) and their feelings toward activities and ideas (Enthusiasm, Valuing and Enjoying Ideas[1] (CAQ); being

[1]Though the loading on "ideas Enjoyed" is negative, the CAQ statement from which it is derived is "Students do not enjoy the ideas studied in this class". Thus, the two negatives "cancel" in this case.

Table I

Significant Correlations ($p < .05$) Between LEI Scales and ALP Items[1]

ALP Items	LEI Scales: Coh	Div	Form	Speed	Envir	Frict	G.Dir.	Favor	Clique	Satis	Disorg	Dif	Apathy	Demo	Comp
A2															
A8															
A9															
A11		-14	-15		-18*							-17	-15	-15	
A13															
A17															
A23															
A24															
L4															
L6									-13				-15		
L7															
L12							14			15				13	
L14	-17		-15		-13				-16	-14	-15		-14		
L16							-17			-19*				-14	
L21															
L22							-15				19*				
P1														14	
P3			14		14		24**			24**	-17			15	
P5															
P10															
P15														13	
P18															
P19	-19*	-18*	-21**	-18*	-21**	-16	-17*	-15	-18*	-16	-18*	-14		14	
P20															

[1]Decimals omitted; read in hundredths

N = 214-233

*$p < .01$

**$p < .001$

Table II
Significant Correlations ($p<.05$) Between CAQ Factors and ALP Items[1]

CAQ Factors

ALP Items	Mem	Trans	Inter	Appl	Analy	Synth	Eval	Discus	Test	Lect	Enth	Indep	Diverg	No Hum	Idea Value	Idea Enjoy[2]	Prep[2]
A2											-19*				-14	22**	
A8				15				16		-13	13						
A9						-15	-17										
A11					-16					-14							22**
A13		13		23**		17*				-15	34**	28**				-24**	
A17											17					-14	
A23								15		-14						-25**	
A24														23**			
L4								-15					-16				
L6						17					22**			22**		-19*	
L7																	
L12				-15		-16				16	-25**					30**	
L14														32**			
L16											-14					22**	26**
L21												15					
L22															13	-24**	-24**
P1			-13		23**					17						19**	-15
P3				-13		-13	-23**	-15			-21*			-25**		22*	
P5			-17	-14	14	-13				13			-17				-22*
P10																	
P15																	
P18																	
P19																	
P20						13					15	18*					

[1]Decimals omitted; read in hundredths

N = 214-233

[2]Interpret "negatively" (i.e., the factors actually measure "lack of Enjoyment," and "little preparation time")

*$p<.01$
**$p<.001$

Table III

Significant Correlations ($p<.05$) Between LEI Scales and CAQ Factors[1]

CAQ Factors	LEI Scales: Coh	Div	Form	Speed	Envir	Frict	G.Dir.	Favor	Clique	Satis	Disorg	Dif	Apathy	Demo	Comp
Mem		-20*	-14	-19*	-14	-20*	-18*						14		
Trans															
Inter														19*	
Appl	-16	-29**	-27**	-31**	-29**	-32**	-32**	-18**		-17*	-17	-16		14	
Analy															
Synth		-36**	-27**	-35**	-28**	-37**	-34**								
Eval										-14		-15			
Discus			-13	-14								-13		15	
Test															
Lect														21*	
Enth		-37**	-24**	-37**	-27**	-41**	-38**								
Indep							-15			-14		-16			
Diverg															
No Hum															
Idea Value													-16		
Idea Enjoy[2]													26**		
Prep[2]								-14		-14					

[1]Decimals omitted; read in hundredths

N = 214-233

[2]Interpret "negatively" (i.e., the factors actually measure "lack of enjoyment," and "little preparation time")

*$p<.01$

**$p<.001$

Table IV
Selected Factor Loadings on Four Factors[1]

Instrument	Variable	(Variance)	Factor I (49.6%)	II (22.3%)	III (14.7%)	IV (13.4%)
LEI	Coh		60		70	
	Div		83			
	Form		86		46	
	Speed		86			
	Envir		87		47	
	Frict		82			
	G. Dir.		82			
	Favor		53		59	
	Clique		53		61	
	Satis		53		76	
	Disorg		57		66	
	Dif		47		66	
	Apathy		-46	-41		
	Demo		-55			
	Comp		-52			
CAQ	Mem					52
	Trans					66
	Inter					61
	Appl		-32	56		48
	Analy					58
	Synth		-33	52		48
	Eval					69
	Discus			42		
	Test					56
	Enth		-36	71		
	Indep			44		
	Idea Value			41		
	Idea Enjoy			-67		
ALP	A17			44		
	L16			-33		

[1] Decimals omitted; read in hundredths

N = 214-233

excited by what is happening -- A 17 (ALP), and lacking Apathy (LEI).

The third factor is again largely derived from the LEI, this time emphasizing a striking combination of personal and group "comfort" (Satisfaction and Cohesiveness, having the highest loadings and sharply separated from the others) and structural and interpersonal sources of tension (Disorganization, Difficulty, Cliqueness and Favoritism). From the selected factor loadings in Table IV it can be seen that the sense of "comfort" is more salient in this factor than are the sources of tension.

Factor IV is based entirely on a clear perception of cognitive emphases and Test/Grade stress in classrooms. That is, after the group characteristics and individual feelings toward ideas and activities are clarified, then students identify the cognitive levels on which their class activities occur and in which their roles take place.

Correlations: Discrete Level Perceptual Relationships

Moving into a more discrete type of analysis, we return to the individual correlations between the scales, items, and factors of the three instruments. We notice in Tables I and II that there are some strong relationships exhibited between ALP items and portions of the LEI and CAQ, although the ALP items had little salience in the factor analysis. While it is impossible to comprehensibly discuss every significant correlation shown, there are some striking patterns in the results.

Concerning the ALP and LEI matrix (Table I), item P 19, "We all helped each other," is negatively correlated with the first 13 LEI scales, those which exhibited positive loadings on Factor I. Because of this, it appears that P 19 is the most "group-sensitive" ALP item, most clearly negatively related to the level of Formality and the adequacy of the physical Environment of the class. The loading of P 19 on Factor I was -.24. While this did not

meet the arbitrary significance level chosen for the factor loadings, it does provide additional evidence that "cooperation" in the classroom works against the group dimensions measured by the LEI. The one clear exception to that generalization is shown by the positive correlation between P 19 and Democratic. Thus when students help each other, they view themselves as having equal influence on the work of the class.

The next clear pattern in the same vein is seen between L 14, the usefulness of learnings, and the LEI dimensions. Here the significant relationships are all negative, illustrating that several group dimensions, notably Cohesiveness, Formality, Environment, Cliqueness, Satisfaction, and Apathy, are seen as contrasted with the utility of what is learned, and the other dimensions are seen as unrelated. While Disorganization also correlated negatively with L 14, the converse, Organization, can be inferred as positively related to L 14. Thus, in terms of student perceptual structure, it appears that when the class is well organized, they believe that they are learning something useful.

ALP item P 3, "We accomplished a great deal," is positively correlated with several LEI scales. From the highest correlations it is seen, first, that students feel a sense of accomplishment when they perceive the Goal Direction of the class and when they are highly satisfied. Additionally, accomplishment is associated with Organization (a lack of Disorganization, to use the LEI terminology), Democraticness, Formality, and physical Environment. Thus, without implying causality, it appears that there is here an identifiable support system for the existence of a sense of accomplishment in classrooms; a set of necessary, though possibly not sufficient, conditions for its existence.

Of the eight Authenticity items on the ALP, the only one which exhibits any significant correlations with LEI scales is A 11, "I felt that

during the activity I could be the sort of person I wanted to be." The salience of this perception of classrooms is in clear contrast with perceptions of high degrees of Diversity, Formality, Difficulty, Apathy, Democraticness and a desirable physical Environment. One could make the argument that these LEI dimensions (except Apathy) are desirable educational means for a variety of purposes. Yet, what appears to be illustrated by the present result is that in making use of such means something of a student's individuality must be compromised. A group vs. individual conflict seems to appear.

The aforementioned fact that no other Authenticity items are significantly related to the LEI group dimensions deserves further consideration. It simply but significantly underlines the distinction between group processes, qualities, or characteristics and personal factors. Thus, group dimensions affect individuals in quite different ways and no one set of group characteristics is maximally beneficial for supporting or enhancing the personal challenge, stimulation, excitement, assimilation, etc. outlined by the ALP Authenticity items.

Two other findings deserve mention, though the commentary will be limited. In a "negative" case, L 22, dealing with issues from the larger society, is negatively related to Goal Direction and Organization, appearing to reflect the complexity of the issues in the society so that they cannot be dealt with in high school classes without interfering with the clarity of the class structure. In a "positive" case, L 12, "We understood the nautre of our task and tried to see what it would require us to do," is positively related to Goal Direction, Satisfaction, and a Democratic sense, implying that students feel satisfied and that they have equal influence when the task and broader goal structure are very clear.

We turn now to the relationships between the ALP items and the CAQ factors (Table II). The first general observation from the table is that

the significant correlations cluster largely in the non-cognitive domain of the CAQ factors. These factors on the CAQ are termed "Classroom Climate", and purport to deal with the affective domain. Thus, the first result to be mentioned in this context is that the ALP relates more to affective than to cognitive categories as distinguished by the CAQ.

For specific patterns, we begin by viewing some of those that appear for the ALP items. Item A 17, "I was excited by what was happening," is positively related to the higher mental processes of Application and Synthesis, and less strongly to Translation. It is negatively related to large amounts of Lecture, indicating two points. One, students are not excited by lecture very much. Two, the Application and Synthesis (and Translation) that excites them is that which is done by themselves and not by the teacher lecturing about applying, synthesizing and translating ideas. This latter notion is further confirmed by the high positive relationship between A 17 and Independence, that is, student independence in exploring and beginning new activities. Also, "excitement" is positively related to Enthusiasm (two labels for the same or similar phenomena?) and Enjoyment of Ideas.

Another such strong pattern, in terms of number of significant correlations, concerns item P 10, "One thing flowed from another," which is an indication of sequence or continuity of ideas or activities as perceived by the students. Here the relationships are all negative. In the cognitive aspects, students do not perceive sequence/continuity to coexist with Discussion Opportunity, presumably indicating that students "break up" smooth discussions. However, students appear more Enthused and Enjoy Ideas more the less the sequence is perceived. And when sequence/continuity is perceived, less humor is apparent.

Item P 15, "We ran into problems and solved them," exhibits the most relationships with the cognitive factors. Thus, solving problems is seen by students as being dealt with "in the mind" rather than through feelings or intuition, as it is hypothesized. Specifically, students see that they solve problems when they carry out Analysis activities, and definitely not when they are Interpreting, Applying or Synthesizing. Problem-solving takes place more often when the teacher lectures more (which raises the question of the extent to which students actually solve problems), when there is a lack of Divergence ("there is one way to solve the problems," or "there is a right or a wrong answer"), and when students put more time into class preparation.

If the matrix in Table II is viewed using the CAQ factors as starting points, additional strong patterns appear. We begin with Enjoyment of Ideas. (Notice from the footnote in the table that these correlations are interpreted "negatively" from their presentation in the table.) We see that students enjoy the ideas studied when they are excited by class events (A 17), felt the time pass quickly (@ 23), and felt like contributing (A 24). That is, the affective nature of enjoyment is confirmed. Other relationships indicate that students enjoy ideas when they understand the nature of and requirements of tasks (L 12) and when they sense their accomplishment (P 3). Apparently, however, students do not take enjoyment in ideas that they perceive as challenging (A 2), or which are related to issues of the larger society (L 22). Nor do those who are keenly aware of their progress (P 5) perceive the enjoyment of ideas (are those who are always told their progress those who are achieving poorly and thus do not enjoy ideas?). Furthermore, sequence/continuity (P 10) and generalizability of the class's group problems (L 16) are negatively related to enjoyment of ideas in students' perceptions.

The CAQ factor of Enthusiasm exhibits most of the same relationships to the ALP items, in one sense confirming the foregoing results, and in another

indicating that Enthusiasm is closely related to feelings about ideas in classes. The additional relationships that show up for Enthusiasm are with A 8, "It made me think new thoughts of my own," and P 20, the contribution of special skills to the activity, both correlations being positive.

Finally, notable in their relative absence, are significant correlations of ALP itmes with CAQ factors representing lower mental processes: Memory (no significant correlations), Translation (one), and Interpretation (two). The inference appears to be that there is a lack of a dynamic or variability, at least in terms of those factors measured by the ALP, when the class activities are concentrated on the lower mental processes.

The final set of correlations to be discussed are those between the LEI scales and the CAQ factors (Table III). As is indicated in the table, the cluster of LEI scales which appeared as most salient in Factor I exhibit strong negative relationships to Enthusiasm, Synthesis, Application and Memory, in order from greatest to least magnitude of correlation. This cluster of LEI scales was labelled "externally controlled elements." In terms of the correlations, it is seen that the more salient the perceptions of this external control, the less the Enthusiasm of the class, the less the amount of Synthesis and Application that takes place, and, to a slightly lesser degree, the less Memory activities are present.

The CAQ Application factor extends the same relationship to other LEI scales: Cohesiveness, Favoritism, Satisfaction, Disorganization, and Difficulty. It is positively related to the Democratic scale however.

Of the scant six positive correlations appearing in Table III, four of them belong to the Democratic scale. Thus, perceived equality of student influence in the class is positively correlated with Application and Analysis activities, Discussion Opportunity and Enthusiasm. Similarly Apathy coexists with Memory activities, but is negatively related to Valuing and Enjoying Ideas.

Summary

In summary of the foregoing findings we refer to the original question: To what extent are the various learning environment instruments empirically related? The answer is complex. From the derived factors, each instrument stands alone, for the most part, and thus the three instruments analyzed are unrelated. The factors obtained included, first, an LEI "group dimensions" factor. Second, a largely CAQ factor was derived, emphasizing student involvement in and feelings toward activities and ideas. This second factor did include, however, Apathy from the LEI scales and "excitement" (A 17) from the ALP items. This result is the only finding in the factors which indicates a relationship across instruments.

The third factor was, again, derived wholly from the LEI, and indicated a sense of personal and group "comfort", with an underlying theme of sources of tensions. The fourth factor was entirely CAQ based, emphasizing perceptions of cognitive activities in the classroom.

Taking the discrete intercorrelations between instruments' items, scales and factors as evidence, a host of relationships were exhibited. It was seen that ALP "cooperativeness" was strongly related to 13 of the 15 LEI scales, though negatively so. There was a clear lack of relationship between Authenticity items on the ALP with the LEI, suggesting a distinction between personal and group factors. Also, the ALP items identifying usefulness of learnings, sense of accomplishment and personal congruence with the class showed clear patterns of relationship to the LEI.

CAQ cognitive and non-cognitive factors were related to ALP items of "excitement" and sequence/continuity. ALP problem-solving was related to the CAQ, especially the cognitive factors of Analysis (positively) and Interpretation, Application, and Synthesis (negatively). The CAQ factors of Enjoyment of Ideas and Enthusiasm related to a wide variety of ALP

items, while the lower mental process factors showed a clear lack of relationship to ALP items.

In examining the LEI and CAQ, it was found that several "external control" scales from Factor I were strongly negatively related to Enthusiasm, Synthesis, Application and Memory. In the CAQ Application factor, the negative relationships were extended to several more LEI scales.

One value evidenced in describing the intercorrelations in detail was to suggest mutually supportive elements of learning environments (positive correlations) and somewhat exclusive elements (negative correlations), elements about which possible choices exist for educators concerned with the effects of classroom activities.

the highest, and other evidence tends to support the fact that it should be rated high (though it is impossible to say "highest"). In the discussion with the class, when asked why they rated Diversity so high, the first response given was, "Of course it's rated high. We come from so many different (ethnic) backgrounds." It appeared that most members of the class nodded in agreement with this statement. The tone of the student's response seemed to indicate "It's so obvious, I'm surprised you even asked." When asked for other reasons Diversity was rated so high, no other response was given. Thus there appears to be a rather poignant awareness of at least the ethnic diversity among the members of the class.

Table V
Selected LEI Scales, Mean Ratings, and Standard Deviations
for the "Observed" Class

Scale	Mean	Standard Deviation	Characteristicness
Diversity	12.375	2.601	Strong
Cohesiveness	19.438	2.961	Strong-moderate
Satisfaction	15.813	3.165	Weak
Goal Direction	17.271	5.024	Moderate-weak

Similarly, Cohesiveness was one of the higher rated items, and the field notes on the class discussions (almost verbatim) indicate a spontaneity of contributions and an apparently "comfortable" interchange of disagreements of the kind that generally appear in groups that know each other well. Additionally, the interview with the teacher revealed that earlier on in the semester an effort was made to "socialize the group ... to get us to understand each other." Several class sessions were spent discussing the "relationships of student to student, of student to teacher," and role-playing simulations took

place when problems arose to get the students to understand the problems and solutions.

On the other hand, Satisfaction was rated as rather uncharacteristic of the class, and this was surprising in terms of the observations. For one, the general tone of class discussions was a vigorous one. The observer noted that roughly two-thirds of the class appeared to regularly participate in discussions. For another, student committees were involved in the planning and evaluation of class activities. Also, a variety of speakers were brought in to the class to discuss what appeared to be topics (police on juvenile problems and rights, civic organizations concerning minorities, "the future of music" as some examples) relevant to the subject, Urban and Future Studies. Taken as a whole, it would appear that these would be conditions conducive to a satisfaction of the class. But obviously we have not observed satisfaction per se. We have observed events about which we have tried to make inferences concerning students' feelings. However, students' expectations and their evaluation of events such as those described would be at least partially involved in the <u>feeling</u> of satisfaction with the class. In this sense, then, the observations by an outsider could not have predicted the students' perception of this dimension with any assurance of accuracy.

One further example reinforces the same notion. Since the range of possible ratings for each LEI scale extends from 7 to 28, 17.5 is the exact middle position, indicating neither agreement nor disagreement that this scale characterizes the class. The class mean for Goal Direction was 17.271, lying slightly on the "disagreement" side. Yet the class structure included sessions which attempted to clarify the class goals(not a common activity, one believes) and occasional class sessions to "evaluate the progress toward our goals." While several explanations for the co-

existence of these activities and the class perception are possible, they would have to be tested as hypotheses in further observation, and the present observations would not have predicted, and cannot help explain, this result, except to suggest hypotheses. The same type of results occurred for the ALP and CAQ.

Thus it appears that the non-participant observer could observe and, to some degree, interpret the meaning for students of events in the classroom. But the instruments of study here measure the students' interpretation of the events, not the events themselves, nor an observer's interpretation of them. An outside observer may be of aid in a more thorough understanding of a classroom's dynamics by pointing out such discrepancies as in the Satisfaction and Goal Direction examples above, and raise hypotheses and test them. But such a process casts little additional light on the elements measured by the instruments themselves. Similarly, because of the distinction made between events and their interpretations and the assessment of each, the value of the observations in "confirming" the Diversity and Cohesiveness examples above is at least dubious and the accuracy of that process is questionable.

Interpretation of Instruments' Similarities

On the second level of analysis, we consider the intention of seeking to understand some broad dynamics of a classroom's functioning, using one or more learning environment instruments as a starting point. In this sense, the instrument(s) can be viewed as types of projective measures, wherein we collect specific perceptions of a class with some additional information as to the organization of the perceptions (relative salience), and infer general principles of operation and effects on students. We will suggest

that observations in addition to the pencil-paper measures are valuable in this regard.

Since this is an exploration unguided by clear theory, the range of discussion is broad and we shall arbitrarily select a few clusters of characteristics indicated by the instruments' results for this class as examples of the types of interpretation of a class that may take place. We begin by presenting in Table VI the juxtaposition of the results of the three instruments for this observed class. As indicated, the data from the three instruments for this class show the relative importance given (mean score) to each of the items. Items for the three instruments which are similar in importance and have been interpreted (in the present study) to be similar in content reveal those perceptions which are particularly salient among students. Items which appear similar in content, but have been rated quite differently from one instrument to another represent apparent inconsistencies of perception. We will present first some item clusters that appear to define "themes" of similar student perception, and evidence concerning the saliency and content of these perceptions will be sought in the observations and interview data for this class. (The themes to be discussed are not intended to be an exhaustive representation of the possibilities in the data. As before, these themes are presented as examples to illustrate the methodological principle being suggested.)

From Table VI it can be observed that across the three instruments the aspects of Diversity (LEI), Independence and Divergence (CAQ), and "thinking new thoughts" (ALP) represent similar or complementary student perceptions. By rating these items as highly characteristic, students indicate that they perceive that class members exhibit different interests, behave independently, are not bound to one solution to a problem, and think some new thoughts of their own. The overlying theme in these items is one of tolerance of

Table VI
Characterization of the "Observed" Class by the Three Instruments

Characteristicness	LEI			ALP				CAQ	
	scale	mean	s.d.	rank	item	mean	s.d.	factor	presence in class*
high	Diversity	21.38	2.601	1.	L22-issues from larger society	7.25	6.615		
				2.	L14-useful learning	7.42	4.907	Independence	Much
				3.	A24-desire to contribute	8.79	4.863	Divergence	
	Environment	20.23	2.414	4.	A8-stimulate new thoughts	9.21	5.405		
	Cohesiveness	19.44	2.961	5.	L12-clear nature & requirements of tasks	9.71	6.975		
				6.	L16-problems which occur in other groups	10.50	7.576		
				7.	L7-concentration on significant tasks	10.63	6.768		
				8.	L6-exemplify good group process	10.92	5.785		
	Cliqueness	18.08	3.322						
	Formality	17.85	2.668	9.	L21-shared purpose guided group	11.67	6.141		
				10.	P15-problem-solving	11.67	6.343	Analysis	
				11.	P5-knowledge of progress	11.67	6.479	Evaluation	Some
				12.	P18-diversity aided the group	12.33	7.257	Discussion Opportunity	
	Democratic Goal Direction	17.33	3.017	13.	P20-contributed special skills	12.67	6.774		
		17.27	5.024	14.	L4-good group reasons for activities	12.96	5.722	Lecture	
	Difficulty	17.06	2.580	15.	A13-clarified previous personal experiences	12.96	6.538		
	Disorganization	16.70	3.949	16.	P1-group decisions and action on them	13.25	6.609		
	Friction	16.48	2.969						
	Competitiveness	16.17	2.371	17.	P19-helped each other	13.46	6.122		
				18.	A11-could be person "I wanted to be"	13.79	7.384		
	Satisfaction	15.81	3.165	19.	P10-sequence, continuity	15.00	6.821	Enthusiasm	None
	Speed	15.63	3.499	20.	A2-challenged by others	15.54	6.620	Humor	
	Apathy	14.71	3.793	21.	A17-excited	16.42	6.440		
	Favoritism	14.04	2.985	22.	A9-felt like rapping afterward	16.54	7.431		
				23.	A23-felt time passed quickly	17.71	5.473		
low				24.	P3-accomplished a great deal	18.63	5.452		

*See Steele (1969) for the scoring and interpretation procedure.

individual concerns: individual student interests, individual conclusions, and individual new thoughts.

For the most part, the classroom observations tend to support the high rating given to this theme. Of the seven classes observed, three were dominated by student-to-student interaction. Because of the personal nature of many student comments in these classes, the observer concluded that the opportunity existed for expressing individual opinions and ideas. Students were free to disagree with other students and the teacher and often did so openly. Rarely did the teacher state that any particular factual material was to be learned by all or that any opinion was necessarily the right one.

The concern for the individual was also found in comments by the teacher in the interview postdating the observations. He stressed the need for "sensitivity to individual students, their insecurities, their authoritarian backgrounds, and their individual capabilities." These expressions resonate with a concern for the individual, and they support the students' contention that individual concerns are dominant characterizations.

Elements of the class perceived to be rather uncharacteristic or absent were rated low by students. From Table VI, it appears that students felt little Satisfaction (LEI), were not very Enthusiastic (CAQ), and did not perceive the class as exciting (ALP). Possibly accompanying this was the ALP perception that "time did not pass quickly". The theme emerging from these perceptions is one of low affect among students.[1]

The observations portray student satisfaction as variable, depending upon the nature of the student activity. In about half of the classes, outside speakers lectured on various topics, and Satisfaction and Enthusiasm

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[1]This is one cluster about which we have strong suspicions that the time of the year influenced its character.

were inferred in the observations to be markedly lower in these classes. In the interview, the teacher stated that satisfaction would vary considerably among students, depending upon their individual orientation to the class. "Some demand special attention like they get from other teachers. Some cannot accept the idea of future studies." With respect to Speed of the class, similar variations were observed. During discussions, the class moved swiftly, but during lecture from outside speakers, there was consisderable evidence of boredom (glazed expressions, little participation, etc.).

Data from observations and instrument data do not coincide to any large degree with respect to the theme of affect. While observational conclusions have assessed student affect as variable (depending upon the activity) the overriding or mean level of student response concerning affect is quite low.

Perceptions which were rated as rather secondary or somewhat doubtful did not form a common theme across all three instruments. However, there were some similarities between items of the LEI and ALP instruments. The extent to which students perceived that they knew what the class was trying to do (Goal Direction) was closely matched by the extent to which they perceived a sense of shared purpose to be guiding their behavior (L 21). Possibly related to this sense of purpose or goal was the similar rating given to item L 4, having good reasons for what was done.

The observations often refer to the absence of discussion or specification of goal direction during the individual classes. Some examples of the way classes were convened show more clearly what actually took place.

Teacher: (Class #1) "Take time now to re-read the assignment I gave you last week in the futures book. When you are finished, raise your hand so I'll know."

Teacher: "We will show the film today, then will discuss it ... Christine,
(Class #2)
would you carry the discussion today?"

Teacher: "Well, I think we have reached the day when two people will give
(Class #3)
their talk, because they both came on the same day finally. Please take over and wax eloquent."

From these statements, we observed that it is made clear to students what they are to do, and that goals for activity may be quite evident. What appears to be absent is some direction concerning what to discuss, what content is most appropriate, or in more blatent terms - what is to be learned.

In the interview, the teacher revealed that periodically considerable attention was given to the assessment of class goals and evaluation of the class purposes with students. He felt that a goal for each class need not be stated, it being subsumed under the overall internalized notions of goal direction engendered by these earlier activities. This bit of history could explain the absence of much "direction" in the observations themselves, except with respect to activity, and could account for the rather low placement of Goal Direction as well. When students perceived Goal Direction, they may have perceived it from the aspect of major objectives, which are only secondarily related to day to day tasks. They may have rated it low also due to the lack of specific reference to content. In this way, students may have reacted similarly to the observer, forming similar impressions as to the absence of Goal Direction. (This theme will receive more attention below.)

In summary thus far, it can be seen that the observations' chief function lies in providing more depth of understanding to the perceptions as categorized by the instruments. While the instrument data reveal the class mean level of perception in each category, and in that sense present the predominant perception of the students in the class, this type of characterization alone is a reduction of the complexity of the actual situation

of the classroom. The observations explicate some of the aspects lost in the reduction process. From the text of the observations, it appears that the aspects of Diversity, Independence, etc., refer primarily to the content of discussions and not to different modes of activities taking place in the class. In relation to the theme of "affect," the observations point out the particular elements of the class that may be satisfying or not to students.

Apparent Differences: Interpretive Issues

The observational data are seen to make further, and perhaps more extensive and valuable, contributions to the explication of elements "lost" in the reduction by the instruments when they are used to cast light on apparent inconsistencies in the students' perceptions of the classroom events. We shall label the following cases interpretive issues, for, as will be seen, it cannot be posited that the "inconsistencies" are anywhere but in the mind of the interpreter, and even there they are not in the end inconsistencies.

As the first example of an interpretive issue, recall that the class was strongly characterized as Diverse, Divergent and Independent. This set of conditions would appear, in this interpreter's judgment, to be ideal for students to challenge one another. Yet the ALP "challenge" item, A 2, is ranked as very uncharacteristic of this class, rank 20. The field notes provide evidence for much disagreement among class members in apparently vigorous discussion. One therefore raises the question, What else is happening in this classroom that allows Diversity, Divergence and Independence to operate and yet leave the students unchallenged?

Several hypotheses are suggested. One, students do not listen to each other and share ideas; they merely express differing opinions until they exhaust themselves. Two, students may listen to each other, but they

do not perceive disagreements as challenges. They do not react to an opinion different from their own as suggesting that they question or reorganize their own views or ideas. They may possibly disregard a different opinion from their own as "wrong" or nonsensical. Three, the students merely may not have the facility or techniques available to them to deal more constructively with the diversity that exists in the class.

The second hypothesis suggests an issue of meaning, which the observational evidence does not shed any determinable light on. The first hypothesis is based on the intent of students; i.e., Do they try to listen and share? Again we cannot judge this intent. But if they do in fact try to listen, then they may not be able to, and we are led to the third hypothesis, that of facility in this class. We ask, Is there any evidence to indicate that an attempt to constructively deal with disagreement takes place by the teacher or student discussion leaders in this class?

To answer the question we search for instances of summaries of discussions, attempts to pool the ideas expressed to provide closure, making generalizations from what was said, class discussions indicated as illustrating the complexity of the issues discussed, general principles presented at the outset which are to be illustrated in the discussions, or established content on which to compare and contrast students' own ideas. We find no such instances in the field notes. In each class observed, the bell rang to end the class in the middle of a discussion. In fact, the apparent vigor of the discussions is so pronounced that no time seems available in class for reflection, a condition indicated as necessary for the educativeness of social inquiry (Thelen, 1960). Thus, we conclude that sufficient mechanism is not provided, as evidenced in the field notes, for creating the "challenge" opportunities in this class. This is not, however, to say that reflection or carryover of discussion outside of the class does not affect the reorganiza-

tion of ideas about the issues dealt with in the class.

The hypothesis that no special constructive attempt is made in the class structure to bring the extant Diversity, Divergence and Independence to closure is further evidenced by the ranking of other ALP items. First, item P 18, diversity aided the group, is ranked 12, the middle position. Thus the diversity existing is not seen by the students as being particularly constructive. Further supporting the general notion are the rankings of a sense of accomplishment (P 3, ranked 24th), and clarification of previous personal experience (A 13, ranked 15th).

The latter is especially striking in that the field notes are replete with students making use of personal experiences in the discussion. For instance, in one discussion the topic centered around "planning for the future". Individual students illustrated points of the discussion with cases of: "eating when my mother serves me; I don't plan it," "I believe in God and am still afraid of death," "I am preparing for college, even though I'm not sure I'm going." In another discussion concerning students' rights, five instances of alleged violation of class members' rights by school authorities were presented. In a question and answer session with a policewoman, numerous personal experiences with police saturated the session. It appears then that there is ample opportunity for clarification of experiences, but that something other than just their "airing" needs to take place. The entire discussion of the factors absent may also account for the low rating given to the Satisfaction scale on the LEI.

As a second example of an interpretive "issue", we view some learning environment elements pertaining directly to structural aspects of the class. On the one hand, the class perceives as salient that they clearly understood the nature and requirements of tasks (L 12, ranked 5th), that they concentrated on the significant aspects of tasks (L 7, ranked 7th), and there was a

tendency to agree that the class was well organized. On the other hand, there is a tendency toward disagreement that Goal Direction characterizes the class, despite the previously mentioned report of the class attending to the goals and evaluating their progress toward them. Thus we ask, Why, in the presence of such clearly structured components, is the Goal Direction not perceived as clear?

One possible explanation might be that the distinction between short-term and long-term objectives is exhibiting itself here. That is, the elements concerning tasks and organization could well be so salient when the discussion topic, or outside speaker's subject, or reading assignment is very clear. But this need only be so on a day-to-day, short-term basis. The wide variety of speakers, of discussion topics, and committee tasks, however, could serve to diffuse the focus of the class. The teacher reports that some 31 speakers were brought in to the class during the semester. During the two weeks of observation, speakers came in representing the police, the city Urban Affairs Division, a minority group organization, and music of the future. In another class, a film, Cities and Suburbs, was shown and discussed. One class period involved the discussion of a reading assignment on planning for the future. Another centered around a student report on a community civil rights organization visited by two students. Though the topics are centered around two themes, Urban and Future studies, the chronological sequence of activities indicated a shift back and forth between the two, and no special transition was evidenced from one class to the next. That this "fragmentation" was evident to the students is suggested by the low ranking of the ALP item of sequence/continuity (P 10, ranked 19th). Thus, we suggest that, though the nature of short-term objectives and tasks are clear to the students, as reflected in the rankings of L 12 and L 7 and the rating of Disorganization, the somewhat fragmented sequencing of the activities leads the students to lose sight of,

or deemphasize the importance of the long-term goals, reflected in the low rating of Goal Direction.

Another, though related, interpretation is as follows. The fact that the overriding goals and purposes were reviewed in this class throughout the semester suggests that students' perceptions should indeed be oriented to the long-range goals. The question remains, Where do they get the goals for the short-range tasks? Students say that tasks are clear, requirements for activity are sought (L 12), and that significant aspects of tasks are concentrated upon (L 6). All these statements refer to the structure of the activity, the process of going through a task. These do not refer necessarily to content. From the interview data, the teacher stresses the importance of exemplifying for his students and training them in how to communicate with each other, how to act in different situations, how to deal with their authoritarian backgrounds. The observations demonstrate a vigilance to the control of student behavior, a sort of "structured informality." What is suggested here is that the goals and purposes concerning how the activity was to be carried out were always clear, but that those referring to the content to be learned were not. Thus, the items rated as characteristic of the class with regard to structure refer to activities, and Goal Direction refers to content. That is, a content-process distinction is perceived by these students.

As was the case with the process of explicating "similarities" across the three instruments, the exercise with the interpretive issues leads to the conclusion that the observations have a function in providing more depth of understanding to students' perceptions as expressed through the learning environment instruments. More particularly, for the interpretive issues, the observations aided in organizing descriptive themes, and helped

raise and test (though not in a rigorous way) hypotheses about the influences on student perception of class and teacher activities, and, again, about the content of the perceptions.

Summary

In summary of the entire portion of the study related to the question, To what extent does intensive observation of classrooms aid in the interpretation of the instruments' characterizations of them?, it is concluded that the observations are of little aid on the level of individual items, scales or factors, but that they are of great value when used to supplement the interpretation of general themes suggested by clusters of elements of the instruments. With regard to the former part of the conclusion, the difference between events and interpretations of events was indicated as limiting the nature of the relationships that might be drawn between observations and instrument responses. In the latter part, that regarding thematic interpretations, the observations served as additional evidence for a more thorough understanding of classroom processes and influences. To qualify the latter conclusion, it seems clear that some descriptive themes might be organized and hypotheses raised of the type discussed above without the use of observational data. But it is doubtful that the extent and certainty of the descriptions and hypotheses could approach those of the present cases, at least in the short time period of the present observations. And certainly the testing of the hypotheses could not proceed as clearly or as confidently as in the foregoing illustrations.

IV. Discussion

This study began with an operationalized definition of the classroom learning environment as "the conglomerate of the students' perceptions of the relationship of the students to the subjects studied, to one another, and to the organizational properties of the class." Three pencil-paper instruments were identified which attempt to assess aspects of that environment, and these three were administered to a group of approximately 230 high school students. The purpose was to determine the extent to which the three learning environment instruments were related in order to establish an empirical base for testing speculations about relationships across the instruments and to discuss the underlying constructs of the theoretical bases of the instruments.

In terms of the underlying constructs, factor analysis of the instruments' results indicated that the clearest component of what was measured were the LEI group dimensions, especially a set of dimensions labelled as "externally controlled elements." This set consisted of Formality, Speed, Goal Direction, Diversity and physical Environment. These dimensions would appear to be controlled primarily by the teacher and the background of the class members independent of the class.

The factor suggests an interesting connection with systems thinking as discussed by Churchman (1968). For him one of the five major considerations in systems thinking is the environment of the system, those factors which affect the operation of the system but over which the system itself has little or no control. The coincidence of the derived factor and Churchman's conception of environment suggests then that insofar as the classroom can be thought of as a system, there is a clearly operational sub-system within which excludes the teacher (i.e., it is a "student system" or a "student subsystem"). In this light Bidwell (1973) states

that "School classes are organized formally into two strata: the teacher and the students" (p. 430). It appears that these strata are to an extent confirmed in the student perceptions.

If the order of the factors and their respective contents are considered as representing the order of clarity of student sensitivities, then it appears that group dimensions are perceived first, with special emphasis on "externally controlled elements." The second area of sensitivity, Factor II, is to the nature of student involvement with intellectual activities and feelings toward ideas (Application, Synthesis, Independence, Enthusiasm, and Valuing and Enjoying Ideas) as measured by the CAQ, and "excitement" as measured by the ALP. The third area, Factor III, indicates personal and group "comfort" (Satisfaction and Cohesiveness) with their underlying sources of tension (Disorganization, Difficulty, Cliqueness, and Apathy), again strongly an LEI factor. Fourth is the identification of the cognitive roles which the students must play in the classroom as indicated by the taxonomic cognitive levels and Test/Grade stress from the CAQ.

Assuming the validity of the measures and the soundness of the statistical manipulations employed, the question is raised: What is it about our schooling system, the culture of the school, or the institutional press that causes the student perceptions to be organized in this way? Further, if the order of organization as described is taken as the effects of school on students, is it desirable? The manifest curriculum stresses intellectual activities and roles, yet these appear in the factor results to be secondary to personal and social areas of awareness. Is the manifest curriculum not capitalizing on students' primary sensitivities? Is it working in opposition to these?

Though such questions are of interest, we are cautioned against making too much of them, for the results described could be attributable to psychometric and statistical artifacts. The factor analysis results suggest this possibility. It was found that the LEI scales dominated the factor loadings, the CAQ factors showed secondary importance, and the ALP items showed a virtual absence of singificant factor loadings. One's feeling is that the cognitive process of responding to the instruments was simplest for the LEI, more difficult for the CAQ and most difficult (relatively) for the ALP. The language of the LEI items appears to involve concepts familiar to high school students. Those of the CAQ items may not be so familiar, as in such examples as "go beyond information given to see what is implied," "logical reasoning and analysis," "using logic and reasoning processes," and "put methods and ideas to use". Though such a judgment about the language of the ALP items does not seem clear, the process of ranking statements from 1 to 24 in order of descriptiveness requires quite a level of complexity of judgment as opposed to responding on a scale of "strongly agree" to "strongly disagree" with four alternatives, as was the case with the LEI and CAQ.

Additionally, the metric employed was not common to all three instruments in that the responses to seven items were added together to provide a scale score for each LEI scale, the responses to one or two items were combined for CAQ factor scores, and ALP items received a score of 1 to 24 in an ipsative manner (i.e., once an item is ranked high by an individual, the chances of any other item receiving a high ranking are decreased, and consecutively so as more items are assigned ranks). Thus the stability of scores used in the analysis of this study would appear to decrease for the LEI, CAQ, and ALP, in that order.

Final resolution of the question of the extent of psychometric and statistical "interference" with the results awaits more competent input from those two areas, and is suggested as an area of further inquiry. Whether or not the matter is resolved, the speculations about the organization of students' sensitivities to aspects of the learning environment stand as speculations to be judged in terms of more concrete organizational, socialization, and/or educational theory.

The relationships between the instruments were further explicated by the examination of the correlations across the respective items, scales and factors. Although many discrete relationships were indicated between specific elements of the instruments, many of the findings which showed strong patterns were negative. It appears that what has been identified through the negative intercorrelations are psychosocial "trade-offs", or areas calling for decisions on the part of the teacher or curriculum maker as to which of two (or more) effects are desired, since the coexistence of some are unlikely, or where compromises must be sought. As a first example, P 19 of the ALP, "cooperation" among class members, shows a negative relationship with most of the group dimensions. These relationships were strongest on the "externally controlled elements," implying, for one, that the locus of control (and perceived authority?) may be shifted to the students in a class by cooperative activities. But in the process, some teacher control must be relinquished. How many teachers are able to relinquish enough control to allow cooperative activities to really "work"?

As a second example of such a decision point, it was found that CAQ Enthusiasm, Synthesis, Application and, to a lesser extent, Memory were negatively related to the "externally controlled elements" of the LEI. If student enthusiasm is viewed as a necessary motivational indicator for

learning, then it appears that extensive external control must be compromised. If Synthesis and Application activities are essential components of a curriculum, then it would appear that they can be successfully implemented only by some decrease in Diversity, Formality, Speed, Friction, and Goal Direction. One suspects that the design of new curricular programs do not take such considerations into account, and the present results suggest that they might profitably do so.

In a more constructive vein, from the positive correlations found, several environmental elements of mutual support were indicated. A feeling of Democraticness, of equal influence among the class members, coexists with a clear task structure (L 12 on the ALP), group decision-making (P 1), a sense of accomplishment (P 3), problem-solving activities (P 15), cooperation (P 19), and Discussion Opportunity (CAQ). Thus, if Democraticness is desired in a class, some other conditions' support might aid its attainment. Similarly, a sense of accomplishment (P 3) seems to be supported by class Formality, good physical Environment, Goal Direction, Organization, and Democraticness from the LEI, and Analysis activities, time spent in preparation, and the Enjoyment and Valuing of Ideas, from the CAQ.

Important in their relative absence are the relationships between group dimensions and ALP Authenticity items and CAQ affective characteristics (with the exception of Enthusiasm). The indication is that a stress on group qualities is not sufficient to successfully meeting personal needs of students or of engendering personal stimulation.

Though the speculations derived from the correlations are interesting, one must approach these results with a degree of caution. Note that the correlations discussed, though statistically significant, are very low, the greatest being 0.41 (Table III), accounting for less than 17% of the common

variance. What the present analysis has done is mask the class effects, which presumably influence the relationship of perceptions considerably. As explained in section II. C. above, the class could not be used as the unit of analysis in this study because of the small number of classes. A larger sample is recommended for future exploration of the same kinds of ideas. Additionally, it would be desirable to have a large enough sample to investigate not only general class effects, but also the effects of specific types of classes, such as different subject areas, types of curriculum, grade level, etc.

In the second portion of the study, the value of intensive observations in aiding in the interpretations of learning environment instruments was investigated. It was found that when these instruments are used in a projective manner to describe the organization of students' perceptions about various elements of the classroom's functioning and effects, then the observations are of value in overcoming some of the reduction that takes place by the instrument data. That is, the observations suggest hypotheses about the differential content of the general perceptions which the instruments measure, and about the activities which affect different perceptions. They suggest organizational themes in the instruments' results which relate to concrete classroom processes. And they enable initial tests of the formulated hypotheses and suggestions to be made. In sum, the observations lead one to a more complete understanding of some of the dynamics of interaction among people, activities, and between the two, in the classroom, than would be attainable simply from the rather static characterizations obtained from the instruments themselves. (The ALP appears to be somewhat of an exception to the "static" description, in that, despite its statistical shortcomings, by its nature it measures perceptions of activities and experiences which are interpretable in a variety of ways.)

To illustrate the values identified concerning the observations' functions, some examples of "similar" and apparently "contradictory" themes, interpretive issues, were presented in the observational analysis. The fact that these were taken as examples is important. That is, other interpreters might identify other themes and issues and inquire about their operation in the same class. It is the explication of the method of interfacing the pencil-paper instruments' results and the observations that is seen to be of primary value. Using the same method, one could approach a classroom from the point of view of any or several conceptions of the teaching-learning process and seek an understanding of the ways in which goals are met and identify some effects (intended or unintended) of particular curriculum processes. This method and these (or related) instruments may provide a way of operationally testing the "nurturant effects" of the models of teaching suggested by Joyce and Weil (1972).

Further discussion of the observational portion of the study must concern itself with two limitations. One can be empirically tested, though not within the scope of this study. It stems from a question: Can the similar themes and interpretive issues described in the study be seen as variables? That is, to what extent do they vary over time in this one class? Also, to what extent do they appear in other classes? For example, if Diversity, Divergence and Independence are always associated with lack of challenge and clarification of students' previous personal experiences, then attempts to explain or understand that situation are futile in terms of one teacher's lack of constructiveness in dealing with the Diversity, Independence and Divergence. It may be that teachers generally cannot deal with it because of some inherent limitations in the conventional teaching process or because of some underlying cultural or psychological phenomena independent of the classroom.

The second limitation involves the cost-benefit concern. Observations are obviously costly in money, time and energy. Their benefit can be determined only by the purposes of the research. If one is studying only those aspects of the learning environment which derive from student perceptions of selected elements of a classroom, then the observations may be of little benefit in comparison with their cost. If one wishes to differentiate perceptions related to different kinds of content and processes that are not known to occur with regularity in a classroom, or if one wishes to examine the influence of specific processes on the perceptions of students, then the observations are extremely beneficial.

As briefly mentioned in connection with the discussion of the factors, theory must play a stronger guiding role in further inquiry about the relationships between instruments, between observations and instruments, in judging the value of the speculations, suggestions and hypotheses raised herein, in identifying further areas of inquiry within this data, and in drawing concrete curricular implications. This report has presented some notions of the extent to which three learning environment instruments are related, and some ways in which observations aid in their interpretation. But its greater value is seen in the "data base" presented as a starting point for more detailed dialogue about specific aspects of learning environments.

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APPENDIX A

Learning Environment Instruments

Learning Environment Inventory Scales and Items

1. Cohesiveness

1. Members of the class do favors for one another.
18. A student has the chance to get to know all other students in the class.
32. Members of the class are personal friends.
56. All students know each other very well.
*R58. Students are not in close enough contact to develop likes or dislikes for one another.
R71. The class is made up of individuals who do not know each other well.
91. Each student knows the other members of the class by their first names.

2. Diversity

4. The class has students with many different interests.
11. Interests vary greatly within the group.
34. Some students are interested in completely different things than other students.
37. Class members tend to pursue different kinds of problems.
72. The class divides its efforts among several purposes.
86. The class is working toward many different goals.
95. Different students vary a great deal regarding which aspects of the class they are interested in.

3. Formality

7. Students who break the rules are penalized.
16. The class has rules to guide its activities.
48. Students are asked to follow strict rules.
R59. The class is rather informal and few rules are imposed.
61. There is a recognized right and wrong way of going about class activities.
68. All classroom procedures are well-established.
81. There is a set of rules for the students to follow.

4. Speed

27. The pace of the class is rushed.
R73. The class has plenty of time to cover the prescribed amount of work.
R75. Students do not have to hurry to finish their work.
85. There is little time for day-dreaming.
87. The class members feel rushed to finish their work.
93. The class has difficulty keeping up with its assigned work.
102. The course material is covered quickly.

5. Environment

2. The books and equipment students need or want are easily available to them in the classroom.
12. A good collection of books and magazines is available in the classroom for students to use.
26. The students would be proud to show the classroom to a visitor.
36. The room is bright and comfortable.
55. There are displays around the room.
R57. The classroom is too crowded.
90. There is enough room for both individual and group work.

6. Friction

8. There is constant bickering among class members.
30. Certain students have no respect for other students.
44. There are tensions among certain groups of students that tend to interfere with class activities.
69. Certain students in the class are responsible for petty quarrels.
82. Certain students don't like other students.
88. Certain students are considered uncooperative.
103. There is an undercurrent of feeling among students that tends to pull the class apart.

7. Goal Direction

10. The class knows exactly what it has to get done.
R23. The objectives of the class are not clearly recognized.
R60. Students have little idea of what the class is attempting to accomplish.
65. The objectives of the class are specific.
67. Each student knows the goals of the course.
83. The class realizes exactly how much work it is required to do.
96. Each student in the class has a clear idea of the class goals.

8. Favoritism

9. The better students' questions are more sympathetically answered than those of the average students.
R14. Every member of the class enjoys the same privileges.
22. The better students are granted special privileges.
49. The class is controlled by the actions of a few members who are favored.
74. Students who have past histories of being discipline problems are discriminated against.
98. Certain students are favored more than the rest.

9. Cliqueness

5. Certain students work only with their close friends.
R20. Students cooperate equally well with all class members.
28. Some students refuse to mix with the rest of the class.
31. Some groups of students work together regardless of what the rest of the class is doing.
76. Certain groups of friends tend to sit together.
R97. Most students cooperate equally with other class members.
100. Certain students stick together in small groups.

10. Satisfaction

6. The students enjoy their class work.
17. Personal dissatisfaction with the class is too small to be a problem.
R21. Many students are dissatisfied with much that the class does.
R38. There is considerable dissatisfaction with the work of the class.
52. The members look forward to coming to class meetings.
63. After the class, the students have a sense of satisfaction.
79. Students are well-satisfied with the work of the class.

11. Disorganization

3. There are long periods during which the class does nothing.
19. The work of the class is frequently interruped when some students have nothing to do.
R33. The class is well organized.
40. The class is disorganized.
R45. The class is well organized and efficient.
70. Many class members are confused during class meetings.
94. There is a great deal of confusion during class meetings.

12. Difficulty

13. The work of the class is difficult.
46. Students are consistently challenged.
R53. The subject studied requires no particular aptitude on the part of the students.
66. Students in the class tend to find the work hard to do.
R78. The subject presentation is too elementary for many students.
R101. Most students consider the subject-matter easy.
104. Many students in the school would have difficulty doing the advanced work of the class.

13. Apathy

39. Failure of the class would mean little to individual members.
50. Students don't care about the future of the class as a group.
54. Members of the class don't care what the class does.
R84. Students share a common concern for the success of the class.
R89. Most students sincerely want the class to be a success.
92. Failure of the class would mean nothing to most members.
R99. Students have a great concern for the progress of the class.

14. Democratic

25. Class decisions tend to be made by all the students.
29. Decisions affecting the class tend to be made democratically.
R35. Certain students have more influence on the class than others.
R42. Certain students impose their wishes on the whole class.
51. Each member of the class has as much influence as any other member.
62. What the class does is determined by all the students.
R80. A few members of the class have much greater influence than the other members.

15. Competitiveness

15. Most students want their work to be better than their friends' work.
41. Students compete to see who can do the best work.
43. A few of the class members always try to do better than the others.
47. Students feel left out unless they compete with their classmates.
R64. Most students cooperate rather than compete with one another.
77. There is much competition in the class.
R105. Students seldom compete with one another.

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*R denotes an item with reverse polarity.

Definitions of LEI Scales

1. Cohesiveness -- the extent to which the students in the class know each other, are friends, are "part of a whole".

2. Diversity -- the extent to which class members exhibit different interests, especially in relation to class activities and goals.

3. Formality -- the extent to which the class has structured procedures and rules to guide behavior. (These rules may be informal; i.e., not always explicitly stated, but nevertheless understood.)

4. Speed -- the pace of the learning activities and the coverage of material.

5. Environment -- the physical environment; the extent to which it is conducive to study and learning the subject.

6. Friction -- tensions between students, bickering, quarreling, lack of interpersonal respect among class members.

7. Goal Direction -- the extent to which the students know what the class is trying to do, where it is going, what is required of them.

8. Favoritism -- the teacher favors the brighter, well-behaved, or otherwise "special" students in teaching lessons or in making decisions about the class.

9. Cliqueness -- the extent to which subgroups of friends within the class keep to themselves or work mainly in their own groups, thus preventing an overall unity in the class.

10. Satisfaction -- the students enjoy and/or are satisfied with the work of the class.

11. Disorganization -- the class does "nothing" for long periods of time, is frequently interrupted in its work, is inefficient; confusion is frequent. (If this is rated "low", then the class is organized.)

12. Difficulty -- the class work and the subject matter is difficult, challenging.

13. Apathy -- the extent to which the students do not care about the success, progress or activities of the class.

14. Democratic -- all class members participate equally in decisions affecting the class; there is no undue influence by a few select members.

15. Competitiveness -- students within the class compete among themselves in class-related work and activities.

Class Activities Questionnaire

1. Remembering or recognizing information is the student's main job.
2. A central activity is to make judgments of good/bad, right/wrong, and explain why.
3. Students actively put methods and ideas to use in new situations.
4. Most class time is spent doing other things than listening.
5. The class actively participates in discussions.
6. Students are expected to go beyond the information given to see what is implied
7. Great importance is placed on logical reasoning and analysis.
8. The student's job is to know the one best answer to each problem.
9. Restating ideas in your own words is a central concern.
10. Great emphasis is placed on memorizing.
11. Students are urged to build onto what they have learned to produce something brand-new.
12. Using logic and reasoning processes to think through complicated problems (and prove the answer) is a major activity.
13. A central concern is practicing methods in life-like situations to develop skill in solving problems.
14. Students are encouraged to independently explore and begin new activities.
15. There is little opportunity for student participation in discussions.
16. Students are expected to read between the lines to find trends and consequences in what is presented.
17. Students are encouraged to discover as many solutions to problems as possible.
18. The ideas studied in this class are more important than grades.
19. Students are excited and involved with class activities.
20. The student's major job is to make judfments about the value of issues and ideas.
21. Great importance is placed on explaining and summarizing what is presented.
22. There is a great concern for grades in this class.
23. Inventing, designing, composing, and creating are major activities.
24. Students do not enjoy the ideas studied in this class.

Class Activities Questionnaire (Continued)

25. There is very little joking or laughing in this class.

26. On the average, the teacher talks how much of the time?
A. 90% B. 75% C. 60% D. 40% E. 25% F. 10%

27. On the average, how much time do you spend preparing for this class each week?
A. None B. ½hr. C. 1hr. D. 1½hrs. E. 2hrs. F. 2½hrs. G. 3hrs. H. 4hrs. I. More than 5hrs.

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CAQ Factors and the Items Included in Each

Factor	Items
Memory	1,10
Translation	9,21
Interpretation	6,16
Application	3,13
Analysis	7,12
Synthesis	11,23
Evaluation	2,20
Discussion Opportunity	5,15
Test/Grade Stress	8,22
Lecture	4,26
Divergence	17
Enthusiasm	19
Independence	14
No Humor	25
Ideas Valued	18
Ideas Enjoyed	24
Preparation Time	27

ALP Items

A 2 I felt really challenged by things others said.

A 8 It made me think some new thoughts of my own.

A 9 I felt like rapping with the teacher and other classmates after the meeting.

A 11 I felt that during the activity I could be the sort of person I wanted to be.

A 13 I felt the activity clarified some previous personal experiences.

A 17 I was excited by what was happening.

A 23 I felt the time passed quickly for me.

A 24 I felt like contributing to the activity.

L 4 As a group we had good reasons for what we did.

L 6 Our meetings at times really exemplified good group process.

L 7 We concentrated our activity on the significant aspects of the task.

L 12 We understood the nature of our task and tried to see what it would require us to do.

L 14 Some of the things we found out will be useful in other situations.

L 16 The problems we had of working together occur regularly in other groups as well.

L 21 Our shared purpose was strong enough to help guide our behavior.

L 22 The issues that troubled us in our group are also prevalent in the larger society.

P 1 We decided what we wanted to do and we did it.

P 3 We accomplished a great deal.

P 5 We knew how well we were progressing in our task.

P 10 One thing flowed from another.

P 15 We ran into problems and solved them.

P 18 The diversity of our individual backgrounds aided the group.

P 19 We all helped each other.

P 20 We each contributed our special skills to make the meeting productive.

APPENDIX B

Intercorrelations of all LEI Scales, ALP Items and CAQ Factors

Intercorrelations of LEI Scales*

	Coh	Div	Form	Speed	Envir	Frict	G.Dir	Favor	Clique	Satis	Disorg	Dif	Apathy	Demo	Comp
Coh		49	87	56	83	38	49	80	93	84	97	73	-21	-23	-23
Div			85	96	80	89	82	26	51	32	38	33	-20	-22	-22
Form				89	96	74	79	65	83	72	80	66	-25	-27	-27
Speed					87	87	90	39	57	51	47	55	-19	-21	-21
Envir						81	89	78	70	78	82	67	-26	-27	-27
Frict							93	43	24	33	38	23	-18	-20	-19
G.Dir								59	36	60	50	55	-21	-22	-22
Favor									55	89	91	68	-18	-20	-19
Clique										72	82	75	-18	-20	-20
Satis											88	93	-20	-21	-21
Disorg												71	-17	-20	-19
Dif													-15	-16	-16
Apathy														70	81
Demo															84
Comp															

*Decimals omitted; read in hundreths

N = 214-233

p <.01 when r = 18
p <.001 when r = 23

Correlations of ALP Items with LEI Scales*

ALP Items

LEI Scales	A2	A8	A9	A11	A13	A17	A23	A24	L4	L6	L7	L12	L14	L16	L21	L22	P1	P3	P5	P10	P15	P18	P19	P20
Coh	-07	-01	-06	-06	-04	04	-10	05	-10	-11	-04	07	-17	-08	02	-01	-09	09	-11	10	-02	-05	-19	-05
Div	-07	-05	-11	-14	-09	-03	-12	03	-10	-10	-05	06	-08	-03	00	04	-11	05	-05	10	-10	-01	-18	-07
Form	-08	-10	-10	-15	-08	07	-13	01	-12	-04	-05	12	-14	-07	02	-02	-12	14	-09	10	-07	-06	-21	-06
Speed	-07	-09	-11	-10	-09	-06	-13	-05	-12	-09	-05	01	-10	05	01	03	-12	01	-06	11	-10	-05	-19	-02
Envir	-10	00	-11	-18	-08	04	-12	05	-13	-06	-05	13	-13	-08	02	00	-12	14	-09	10	-08	-07	-21	-09
Frict	-08	-06	-11	-10	-08	04	-11	-06	-10	-12	-05	00	-05	06	00	12	-10	01	-04	08	-11	-03	-16	-04
G.Dir	-09	-03	-11	-11	-09	08	-10	05	-12	-06	-05	14	-08	-17	01	-15	-11	24	-05	09	-10	-08	-17	-07
Favor	-08	-03	-06	-03	-03	-01	-08	-07	-10	-07	-04	02	-12	07	02	11	-07	-08	-08	08	-02	-01	-15	-01
Clique	-05	-04	-05	-10	-05	-01	-10	00	-09	-13	-04	02	-16	02	02	06	-09	04	-10	10	-02	-03	-18	-08
Satis	-07	-03	-07	-09	-05	13	-07	06	-11	-07	-04	15	-14	-19	03	-10	-09	24	-09	09	-03	-07	-16	-07
Disorg	-07	-03	-06	-03	-03	-06	-10	-09	-10	-11	-04	-05	-15	12	02	19	-07	-17	-10	11	-02	-03	-18	-07
Dif	-05	-12	-06	-17	-06	-13	-07	-05	-10	-06	-04	03	-13	00	02	-02	-09	11	-08	11	-03	-06	-13	-09
Apathy	06	-07	10	-15	02	-09	-02	-11	02	-15	01	-02	14	09	-06	10	13	-08	05	12	06	-03	03	-07
Demo	-13	-08	07	-15	-11	00	10	00	07	-08	01	13	07	-14	-02	-07	14	15	07	02	13	-08	14	-09
Comp	-03	-05	09	-13	03	00	03	-01	03	-09	00	03	10	-01	-07	01	09	10	05	01	10	-05	04	-10

*Decimals omitted; read in hundreths

N = 214-233

p <.01 when r = 18
p <.001 when r = 23

Correlations of CAQ with LEI Scales*

CAQ Factors

LEI Scales	Mem	Trans	Inter	Appl	Analy	Synth	Eval	Discus	Test	Lect	Enth	Indep	Diverg	No Hum	Idea Value	Idea +Enjoy	+Prep
Coh	-03	00	-07	-16	10	-11	-10	-10	-05	-07	-03	-08	-09	-10	06	-02	-12
Div	-20	02	10	-29	11	-36	08	-11	04	-04	-37	-05	-01	-10	07	-04	02
Form	-14	01	01	-27	12	-27	-02	-13	00	-07	-24	-08	-06	-12	06	-02	-07
Speed	-19	02	06	-31	12	-35	04	-14	04	-04	-37	-12	-02	-10	04	00	00
Envir	-14	01	00	-29	12	-28	-02	-13	01	-09	-27	-11	-07	-13	04	00	-08
Frict	-20	02	11	-32	11	-37	10	-09	07	-08	-41	-09	-03	-12	02	02	02
G.Dir.	-18	03	04	-32	10	-34	04	-11	05	-08	-38	-15	-04	-12	01	01	-02
Favor	-01	00	-08	-18	08	-10	-10	-08	-03	-10	-07	-12	-11	-11	01	03	-14
Clique	-03	00	-07	-12	08	-09	-11	-12	-06	-03	-01	-07	-05	-07	06	-03	-10
Satis	-02	01	-12	-17	07	-09	-14	-11	-04	-07	-06	-14	-08	-09	02	01	-14
Disorg	-01	00	-07	-17	09	-10	-11	-10	-05	-08	-03	-10	-11	-11	03	01	-13
Dif	-02	02	-12	-16	07	-08	-15	-13	-03	-03	-08	-16	-06	-07	01	02	-11
Apathy	14	02	07	02	09	02	-03	-06	04	08	-09	-08	-07	-05	-16	26	11
Demo	10	02	-05	19	14	12	00	15	07	02	21	01	09	02	02	-10	-04
Comp	07	-04	-04	09	10	07	-04	08	01	03	11	00	05	03	-05	02	01

*Decimals omitted; read in hundreths

N = 214-233

$p < .01$ when $r = 18$
$p < .001$ when $r = 23$

+Interpret "negatively" (i.e., the factors actually measure "lack of enjoyment," and "little preparation time")

Intercorrelations of ALP Items*

	A2	A8	A9	A11	A13	A17	A23	A24	L4	L6	L7	L12	L14	L16	L21	L22	P1	P3	P5	P10	P15	P18	P19	P20
A2		00	05	05	-05	-12	00	-11	-03	-11	-06	-24	02	09	-02	08	-06	-09	-01	13	-09	02	-11	-10
A8			04	23	11	27	03	15	-15	-08	-16	-12	01	-18	-19	-07	-04	-07	-12	-11	-19	-10	-12	-17
A9				18	02	00	03	07	01	-14	-24	-13	-06	-09	-04	-02	-10	-10	-10	-10	-09	-10	-04	-15
A11					02	15	07	09	-06	-01	-07	-25	-06	-15	-09	-08	-01	-21	-26	-20	-24	-02	-10	-09
A13						10	-16	-03	-18	-02	00	-14	15	06	00	21	-15	-22	-14	-13	-22	09	-12	-06
A17							22	22	-02	-11	-20	-07	-09	-28	-16	-17	00	14	-15	-13	-26	-21	-11	-02
A23								08	-06	-15	-20	-12	-08	-09	-14	-12	-11	20	01	08	-05	-26	-05	-18
A24									-06	-10	-14	-09	-06	-23	-14	-29	-06	-01	-12	-07	-03	-08	01	-03
L4										00	03	01	-08	03	03	-12	09	-01	-08	-11	10	-09	07	01
L6											06	03	01	03	16	-02	-14	-05	05	-11	-09	13	-05	01
L7												09	-06	07	-10	-06	03	10	02	04	15	12	05	-04
L12													09	-08	17	-16	12	06	05	-20	05	00	-05	11
L14														-02	-01	13	-20	-09	-06	-09	04	04	-17	-12
L16															-03	37	-06	-33	-01	-01	10	10	-16	-11
L21																01	-07	-07	-03	-15	-07	-01	-01	16
L22																	-05	-35	-08	-06	-13	14	-14	-05
P1																		-06	-04	01	06	-12	07	04
P3																			01	08	22	-29	09	00
P5																				14	11	-01	05	-01
P10																					13	-07	-01	-13
P15																						-14	03	-12
P18																							-03	14
P19																								23
P20																								

*Decimals omitted; read in hundredths

N = 214-233

.01 $p < .01$ when $r = 18$

.001 $p < .001$ when $r = 23$

Correlations of CAQ Factors with ALP Items*

CAQ Factors

ALP Items	Mem	Trans	Inter	Appl	Analy	Synth	Eval	Discus	Test	Lect	Enth	Indep	Diverg	No Hum	Idea Value	Idea +Enjoy	+Prep
A2	00	-03	03	-11	-10	-04	-02	-09	05	02	-19	-11	-13	-03	-13	22	10
A8	-05	03	07	14	00	07	07	16	-10	-13	13	07	05	00	07	-08	06
A9	00	-08	-08	-05	00	-15	-17	06	05	05	03	03	00	-13	-06	06	-07
A11	-03	09	06	04	-13	02	09	06	-02	-10	09	03	10	-01	10	-11	09
A13	09	-06	00	02	-16	05	00	-07	-02	-14	00	06	-01	12	-08	11	22
A17	-02	13	10	23	-02	17	02	03	-07	-15	34	28	12	02	08	-24	03
A23	-01	05	-07	12	-07	02	-05	09	-09	00	17	02	03	-02	06	-14	-05
A24	-02	01	-04	11	01	10	03	15	-03	-14	09	07	-01	-09	13	-24	-08
L4	07	00	03	-09	04	-01	-03	-04	-04	-03	03	-11	-01	-06	-04	01	00
L6	-06	-01	03	-03	-03	-01	00	00	-06	07	02	-02	13	23	01	-02	04
L7	-02	-11	01	01	00	00	03	-15	05	00	-07	-10	-16	01	-09	06	00
L12	07	07	03	12	12	17	13	11	13	02	22	04	00	22	02	-18	-02
L14	00	03	02	02	01	10	10	02	00	03	-04	-02	-09	01	02	-03	08
L16	-04	-06	-07	-15	-10	-16	-07	-10	00	16	-25	-10	-06	03	-07	30	12
L21	06	04	07	01	04	03	06	-02	01	03	02	-01	01	32	02	-04	-10
L22	-08	-05	01	-07	-08	-07	02	-03	-05	06	-14	-03	-10	-01	-10	21	26
P1	07	07	01	05	-05	10	06	01	04	08	04	15	09	00	-02	05	06
P3	00	-03	-13	03	23	07	-06	09	02	05	12	05	04	-07	13	-24	-24
P5	06	01	00	-08	07	-06	-01	-04	13	17	-06	-07	00	09	-08	19	-15
P10	-04	-03	01	-13	02	-13	-23	-15	-03	12	-21	-09	-04	-25	-08	21	-04
P15	03	-05	-17	-14	14	-13	-11	-12	-02	13	-13	-17	-13	01	-04	09	-22
P18	-01	-08	07	02	-10	05	12	-01	-05	00	-03	-12	-03	-02	-07	00	-01
P19	09	00	-06	10	02	10	02	08	-03	-02	11	05	07	-04	07	-01	-07
P20	-02	-05	05	11	-11	13	-02	04	02	-08	15	18	08	08	-07	-09	06

*Decimals omitted; read in hundreths

N = 214-233

$p < .01$ when $r = 18$
$p < .001$ when $r = 23$

+Interpret "negatively" (i.e., the factors actually measure "lack of enjoyment," and "little preparation time")

Intercorrelations of CAQ Factors*

	Mem	Trans	Inter	Appl	Analy	Synth	Eval	Discus	Test	Lect	Enth	Indep	Diverg	No Hum	Idea Value	Idea +Enjoy	+Prep
Mem		45	34	28	38	32	35	-04	46	06	-02	-10	04	12	-19	11	-12
Trans			46	44	40	48	53	03	37	-04	04	23	17	02	09	-06	04
Inter				38	33	33	48	-01	27	-13	03	23	25	02	-04	-05	08
Appl					26	63	43	23	21	-25	62	39	21	08	17	-45	09
Analy						28	38	04	41	05	03	-10	03	-12	05	-08	-30
Synth							44	22	23	-27	53	34	25	07	24	-41	06
Eval								12	35	-09	12	19	13	10	11	-23	05
Discus									-06	-17	41	22	12	-06	30	-50	-04
Test										08	-11	-05	04	07	-34	10	-15
Lect											-26	-19	-01	13	-09	34	-11
Enth												29	11	02	28	-61	-03
Indep													25	04	23	-20	20
Diverg														13	19	-07	06
No Hum															-03	02	01
Idea Value																-32	00
Idea +Enjoy																	10
+Prep																	

*Decimals omitted; read in hundreths

N = 214=233

p <.01 when r = 18
p <.001 when r = 23

+Interpret "negatively" (i.e., the factors actually measure "lack of enjoyment," and "little preparation time")

APPENDIX C

Factor Loadings and Communalities for Classroom Learning Environment Variables

FACTOR ANALYSIS OF 3 CLE INSTRUMENTS

FILE NONAME (CREATION DATE = 06/05/75)

VARIABLE	COMMUNALITY	FACTOR
CONES	0.87124	1
DIVERS	0.74349	2
FORMAL	0.95602	3
SPEED	0.82707	4
ENTR	0.99510	
EDICT	0.73576	
GOALORI	0.75480	
FAVOR	0.62535	
CLIQUE	0.56367	
SATISF	0.87802	
DESIRG	0.78111	
DIFFIC	0.67048	
APATHY	0.41953	
DEMOCRAT	0.42375	
COMPETE	0.37754	
A2	0.03639	
A9	0.10095	
A6	0.02842	
A11	0.13462	
A13	0.03829	
A17	0.10939	
A23	0.05941	
A24	0.09689	
L4	0.02405	
L6	0.02274	
L7	0.02979	
L12	0.07653	
L14	0.03304	
L16	0.14578	
L21	0.00563	
L22	0.07482	
P1	0.03228	
P3	0.10715	
P5	0.07214	
P10	0.09662	
P15	0.16203	
P18	0.02066	
P19	0.05856	
P20	0.02599	
MSM	0.34728	
TRANSL	0.47387	
INTERP	0.42844	
APPLIC	0.64674	
ANALYS	0.41361	
SYNTH	0.62055	
EVAL	0.55902	
DISCUS	0.20149	

Factor Analysis on 3 CLE Instruments

TEST STR	0.35710
LECTURE	0.15825
VAR19 (Enthusiasm)	0.69530
VAR14 (Independence)	0.23290
VAR17 (Divergence)	0.09525
VAR25 (No Humor)	0.02542
VAR18 (Value Ideas)	0.17203
VAR24 (Enjoy Ideas)	0.47735
VAR27 (Preparation Time)	0.08872

EIGENVALUE	PCT OF VAR	CUM PCT
9.14642	49.6	49.6
4.12200	22.3	71.9
2.71365	14.7	86.6
2.46263	13.4	100.0

FACTOR ANALYSIS ON 3 CLE INSTRUMENTS

FILE NONAME (CREATION DATE = 06/05/75)

[illegible] FACTOR MATRIX

	FACTOR 1	FACTOR 2	FACTOR 3	FACTOR 4
[illegible]	0.60301	0.05549	0.70571	-0.03071
[illegible]	0.83464	-0.13599	0.05196	0.16127
[illegible]	0.85604	-0.15121	0.46533	0.05193
[illegible]	0.86417	-0.17843	0.17114	0.13836
[illegible]	0.87330	-0.16515	0.47512	0.05313
[illegible]	0.82807	-0.13227	-0.00801	0.17311
[illegible]	0.82044	-0.11622	0.23082	0.12204
[illegible]	0.52734	-0.02335	0.59238	-0.07702
[illegible]	0.53083	0.02609	0.61355	-0.07282
[illegible]	0.52950	0.04913	0.76496	-0.10035
[illegible]	0.57211	-0.02409	0.66732	-0.08395
[illegible]	0.47158	-0.06174	0.66202	-0.17749
[illegible]	-0.45743	-0.40584	0.14301	0.16118
[illegible]	-0.54556	-0.13314	0.28257	0.18033
[illegible]	-0.51588	-0.23521	0.21309	0.12204
[illegible]	-0.20038	-0.17133	-0.15154	-0.14219
[illegible]	0.02362	0.29786	-0.09801	-0.04954
[illegible]	-0.10310	0.00012	-0.01529	-0.13250
[illegible]	0.02257	0.28608	-0.21403	-0.09141
[illegible]	0.02262	0.04007	-0.17022	-0.05698
[illegible]	0.03086	0.44436	0.02673	0.01623
[illegible]	-0.14246	0.16956	0.04504	-0.09078
[illegible]	0.00460	0.29371	0.04105	-0.04209
[illegible]	-0.14033	-0.26581	-0.00481	-0.00193
[illegible]	-0.00506	0.02380	-0.14764	-0.01879
[illegible]	-0.06032	-0.16018	-0.00147	0.12196
[illegible]	-0.02202	0.05774	0.16445	0.21086
[illegible]	-0.08365	-0.03779	-0.14068	0.06321
[illegible]	0.03570	-0.33484	-0.16177	-0.07384
[illegible]	0.03027	-0.00850	-0.01015	0.19243
[illegible]	0.09415	-0.19110	-0.16560	-0.04451
[illegible]	-0.15736	-0.01631	0.02774	0.08048
[illegible]	-0.06485	0.10046	0.30221	0.03896
[illegible]	-0.12467	-0.22413	0.01743	0.07739
[illegible]	0.03882	-0.26329	0.13867	-0.06247
[illegible]	-0.15514	-0.29288	0.19331	-0.03450
[illegible]	0.03597	-0.04897	-0.16405	0.00759
[illegible]	-0.23767	0.04389	0.00495	0.12029
[illegible]	-0.02995	0.13959	-0.07359	0.02262
[illegible]	-0.21535	-0.09482	0.10978	0.52902
[illegible]	0.00130	0.16213	0.02476	0.66855
[illegible]	0.07563	0.12157	-0.16565	0.61681
APPLIC	-0.21864	1.55375	0.03225	0.43039

FACTOR ANALYSIS ON 3 CLE INSTRUMENTS - FIRST RUN

FILE NONAME (CREATION DATE = 06/05/75)

	FACTOR 1	FACTOR 2	FACTOR 3	FACTOR 4
ANALYS	-0.02793	-0.05339	0.25887	0.59563
SYNTH	-0.32581	0.52114	0.09236	0.48475
EVAL	0.04823	0.22307	-0.15927	0.69417
DISCUS	-0.14455	0.42374	0.01679	0.02500
TESTSTR	-0.02911	-0.17559	0.02181	0.56065
[illegible]	-0.09449	-0.38500	-0.03368	-0.04161
	-0.36714	0.71490	0.22185	0.01409
VAR14	-0.05717	0.44415	-0.10003	0.14210
VAR17	-0.02750	0.22975	-0.07403	0.18362
VAR25	-0.08542	0.01536	-0.10249	0.08576
VAR19	0.03755	0.40708	0.06085	-0.03459
VAR24	0.03145	-0.57205	-0.12834	-0.09109
VAR27	0.05584	0.36784	-0.23391	-0.03240

TRANSFORMATION MATRIX

	FACTOR 1	FACTOR 2	FACTOR 3	FACTOR 4
FACTOR 1	0.84620	-0.43971	0.27554	-0.06358
FACTOR 2	0.01341	0.70652	0.29110	0.63513
FACTOR 3	0.02152	-0.53503	-0.08475	0.84030
FACTOR 4	-0.49914	-0.14456	0.82925	-0.05006